

## Muscles of Pectoral Region

Muscle	Origin	Insertion	Major relations	Action	N. Supply
① <u>Subclavius</u>	1 <sup>st</sup> costo-chondral <u>junction</u>	Subclavius groove of the clavicle.	Ensheathed by 2 laminae derived from the upper part of the clavopectoral fascia: a) Ant. lamina → pierced by clavicular br. of thoraco-acromial a. b) Post. lamina → pierced by n. To subclavius.	a) Steadies the <u>clavicle</u> . b) Soft pad protecting the axillary nn. and vessels from the <u>clavicle</u> . c) Prevents <u>over movements</u> of the <u>clavicle</u> .	<u>N. to subclavius</u> (C <sub>5,6</sub> ). It is a br. of upper trunk of brachial plexus.
② <u>Pectoralis minor</u>	3 <sup>rd</sup> , 4 <sup>th</sup> and 5 <sup>th</sup> ribs, just <u>lat.</u> to their cartilages.	Med. border + upper surface of the coracoid process.	a) It crosses in front of the axillary contents dividing the axillary a. into 3 parts. b) Its upper border is attached to the clavopectoral fascia. c) Its lower part is attached to the suspensory lig. of the axilla. d) It is pierced by the med. pectoral n.	a) Depression, <u>protraction</u> and <u>downwards rotation</u> of the <u>scapula</u> . b) Reversed action → <u>raise ribs in forced inspiration</u> .	<u>Med. and lat. pectoral nn.</u>
③ <u>Pectoralis major</u>	① <u>Clavicular head</u> : from med. 1/2 of front of clavicle. ② <u>Sterno-costal head</u> : from: - ant. surface of sternum. + - upper 6 costal cartilages + - aponeurosis of ext. oblique.	The m. fs. are twisted and the m. is inserted by a U-shaped <u>bilaminar tendon</u> into the lat. lip of the bicipital groove. • The ant. lamina is formed by the <u>clavicular</u> and upper <u>sternocostal</u> parts. • The post. lamina is formed by the <u>lower sternocostal</u> part.	• The lower rounded border is called the <u>ant. axillary fold</u> . • Deep relations → subclavius + pectoralis minor + clavopectoral fascia + axilla and its contents. • Superficial relations → skin + s.f. (containing platysma and breast) + pectoral fascia. • Separated from the deltoid by <u>deltoid-pectoral groove</u> which contain: ① Deltoid br. of thoraco-acromial a. ② Upper part of cephalic vein. ③ Deltopectoral L.Ns.	a) Flexion, adduction and med. rotation of arm. b) Reversed action: • raises ribs in forced inspiration. • helps in climbing.	<u>Med. and lat. pectoral nn.</u> They enter the m. in a reversed way to their names.

N.B. The pectoralis major is one of padding m.. These are the flat ms. of the U.L. which cover and originates from the trunk. They include:

- Pectoralis major.
- Trapezius.
- Serratus anterior.
- Latissimus dorsi.

## Muscles of the Back

Layer	Muscle	Origin	Insertion	Action	N. Supply
1 <sup>st</sup> layer	① <u>Trapezius</u>	<ul style="list-style-type: none"> <li>• Med. <math>\frac{1}{3}</math> of sup. nuchal line.</li> <li>• External occipital protuberance.</li> <li>• Ligamentum nuchae.</li> <li>• Spine of C<sub>7</sub> + all thoracic spines.</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Upper fs.</u> (occipital + upper cervical) → back of lat. <math>\frac{1}{3}</math> of clavicle.</li> <li>• <u>Middle fs.</u> (lower cervical – upper thoracic) → med. border of acromion + upper lip of crest of spine of scapula.</li> <li>• <u>Lower fs.</u> (lower thoracic) → converge to be inserted in root of the spine.</li> </ul>	<ul style="list-style-type: none"> <li>• <u>Upper fs.</u> → elevate the shoulder girdle.</li> <li>• <u>Middle fs.</u> → retract the scapula.</li> <li>• <u>Lower fs.</u> → depress the scapula and rotate it upwards.</li> </ul>	<ul style="list-style-type: none"> <li>• Motor → spinal accessory n.</li> <li>• Sensory (proprioceptive) → C<sub>3,4</sub>.</li> </ul>
	② <u>Latissimus dorsi</u>	<ul style="list-style-type: none"> <li>• Lower 6 thoracic spines (under trapezius).</li> <li>• Lumbar fascia.</li> <li>• Outer lip of iliac crest.</li> <li>• Lower 3-4 ribs.</li> <li>• Back of inf. angle of scapula.</li> </ul>	<p>The ms. converge into a flat tendon which makes a <u>triple relation</u> around the <u>teres major</u> (1<sup>st</sup> behind it, then <u>below</u> it and finally in front of it) to be inserted into the floor of the bicipital groove.</p>	<ul style="list-style-type: none"> <li>• Extension, adduction and medial rotation of arm.</li> <li>• Reversed action → helps in climbing.</li> </ul>	<p>N. to <u>latissimus dorsi</u> (thoraco-dorsal n.) from post. cord of brachial plexus.</p>
2 <sup>nd</sup> layer	③ <u>Levator scapulae</u>	Upper 4 cervical transverse processes.	Dorsal aspect of med. border of scapula above root of spine.	<ul style="list-style-type: none"> <li>• Elevates the scapula.</li> <li>• Flexes the neck laterally.</li> </ul>	<ul style="list-style-type: none"> <li>• N. to <u>rhomboids</u>.</li> <li>• C<sub>3,4</sub> ventral rami.</li> </ul>
	④ <u>Rhomboides minor</u>	<ul style="list-style-type: none"> <li>• Lower part of ligamentum nuchae.</li> <li>• C<sub>7</sub>, T<sub>1</sub> spines.</li> </ul>	Dorsal aspect of med. border of scapula opposite the root of spine.	<ul style="list-style-type: none"> <li>• Retract the scapula.</li> <li>• Rotate scapula downwards.</li> </ul>	<p>N. to <u>rhomboids</u> (dorsal scapular n.) from C<sub>5</sub> root of the brachial plexus.</p>
	⑤ <u>Rhomboides major</u>	T <sub>2</sub> → T <sub>5</sub> spines	Dorsal aspect of med. border of scapula below the root of spine.		

## Muscles of Shoulder Region

Muscle	Origin	Insertion	Action	N. Supply
① <u>Deltoid</u> (m. of shoulder contour)	Correspond to insertion of trapezius: ① Ant. fs. (parallel) → <u>front</u> of lat. $\frac{1}{3}$ of <u>clavicle</u> . ② Middle fs. (multipennate) → lat. border of <u>acromion</u> . ③ Post. fs. (parallel) → <u>lower</u> lip of crest of spine.	<ul style="list-style-type: none"> <li>• Deltoid <u>tuberosity of the humerus</u>.</li> </ul> <p><u>N.B.</u> : Structures under cover of deltoid → see text below.</p>	<ul style="list-style-type: none"> <li>• Ant. fs. → flex arm and rotate it medially.</li> <li>• Middle fs. → abduct arm from <math>15^\circ \rightarrow 90^\circ</math>.</li> <li>• Post. fs. → extend arm and rotate it laterally.</li> </ul>	<u>Axillary N.</u>
② <u>Supraspinatus</u>	Medial $\frac{2}{3}$ of the <u>supraspinous fossa</u> .	<ul style="list-style-type: none"> <li>• Upper impression of <u>greater tuberosity</u>.</li> <li>• The m. is separated from acromion by <u>subacromial bursa</u>. The bursa may extend deep to the deltoid → <u>subdeltoid bursa</u>.</li> </ul>	<ul style="list-style-type: none"> <li>• Abducts arm from <math>0 \rightarrow 15^\circ</math>.</li> <li>• Fixes head of humerus in <u>glenoid cavity</u>.</li> </ul>	<u>Suprascapular N.</u>
③ <u>Infraspinatus</u>	Medial $\frac{2}{3}$ of the <u>infraspinous fossa</u> .	<ul style="list-style-type: none"> <li>• Middle impression of <u>greater tuberosity</u>.</li> <li>• The m. is separated from the shoulder J. by <u>infraspinatus bursa</u>.</li> </ul>	<ul style="list-style-type: none"> <li>• Rotates the arm laterally.</li> <li>• Fixes head of humerus in the <u>glenoid cavity</u>.</li> </ul>	<u>Suprascapular N.</u>
④ <u>Teres minor</u>	Upper $\frac{2}{3}$ of dorsal aspect of lat. border of <u>scapula</u> .	Lower impression of <u>greater tuberosity</u> .	<ul style="list-style-type: none"> <li>• Adducts + laterally rotates the arm.</li> <li>• Fixes head of humerus in the <u>glenoid cavity</u>.</li> </ul>	<u>Axillary N.</u> (post division).
⑤ <u>Teres major</u>	Dorsal aspect of lower $\frac{1}{4}$ of lat. border of <u>scapula</u> including back of inf. angle.	Medial lip of the bicipital groove.	<ul style="list-style-type: none"> <li>• Adducts, extends and <u>medially rotates the arm</u>.</li> </ul>	<u>Lower subscapular N.</u>
⑥ <u>Subscapularis</u>	Medial $\frac{2}{3}$ of <u>subscapular fossa</u> . The bone is marked by ridges indicating the sites of attachment of the intra-muscular tendinous bands (the m. is multipennate).	<ul style="list-style-type: none"> <li>• Lesser tuberosity of <u>humerus</u> and the bone just below it.</li> <li>• It is separated from shoulder J. by <u>subscapular bursa</u>.</li> </ul>	<ul style="list-style-type: none"> <li>• Adducts + medially rotates the arm.</li> <li>• Fixes head of humerus in the <u>glenoid cavity</u>.</li> </ul>	<u>Upper + lower subscapular N.</u>

## Muscles of Arm

Muscle	Origin	Insertion	Action	N. Supply
① <i>Brachialis</i>	<ul style="list-style-type: none"> <li>Front of lower <math>\frac{1}{2}</math> of humerus.</li> <li>Front of the 2 intermuscular septa.</li> </ul>	Into the front of the coronoid process of ulna (mainly to the ulnar tuberosity).	Main flexor of elbow.	<ul style="list-style-type: none"> <li>Medial major part → musculocutaneous n.</li> <li>Lateral minor part → radial n.</li> </ul>
② <i>Biceps brachii</i>	<p>① Long head: from the supraglenoid tubercle. Its start is <u>intra</u>capsular <u>extra</u>synovial. It pierces the front of the capsule → runs in the bicipital groove fixed by transverse lig. of the humerus. The latter is stretched bet. the humeral tuberosities.</p> <p>② Short head: from the tip of coracoid process.</p> <p>The 2 heads unite at the lower <math>\frac{1}{3}</math> of arm.</p>	<p>① Mainly, by a strong tendon to the post. rough part of the radial tuberosity. The tendon is separated from the ant. smooth part by a bursa.</p> <p>② <i>Bicipital aponeurosis</i>, which is a flattened extension from the median side of the tendon to the deep fascia of the upper medial part of forearm. It separates the medial cubital v. (superficial to it) from the median n. and brachial a. (deep to it).</p>	<p>① Flexion of elbow.</p> <p>② Supination of forearm.</p> <p>③ The long head supports the shoulder J. from above.</p> <p>④ The short head → helps in flexion of shoulder J.</p> <p>⑤ The bicipital aponeurosis stretches the deep fascia of arm and protects the median n. and brachial a.</p>	Each head receives a separate br. from the musculocutaneous n.
③ <i>Coracobrachialis</i>	Tip of coracoid process (in common with the short head of biceps). The muscle is pierced by the musculocutaneous n.	<ul style="list-style-type: none"> <li>Middle of medial border of humerus.</li> <li>Events at the level of its insertion → See below.</li> </ul>	<ul style="list-style-type: none"> <li>Weak flexion of arm.</li> <li>Adduction of arm.</li> </ul>	musculocutaneous n. (before it pierces the m.)
④ <i>Triceps brachii</i>	<p>① Long head: from the infraglenoid tubercle.</p> <p>② Lateral head: from back of humerus above and parallel to the spiral groove.</p> <p>③ Medial head: from back of humerus below the spiral groove + back of both intermuscular septa (i.e., mirror image to brachialis).</p> <p>The 3 heads unite at middle of arm.</p>	<p>① Into the post. part of the upper surface of the olecranon process of ulna.</p> <p>② Few deep fs. are inserted in the capsule of the elbow joint forming the <i>articularis cubiti m.</i></p>	<p>① Main extensor of elbow.</p> <p>② The long head supports shoulder J. from below.</p> <p>③ <i>Articularis cubiti</i> → pulls the capsule of elbow J. during extension.</p>	<p>Separate brs. from the radial n.</p> <p>① Radial n. in the axilla → long + med. heads.</p> <p>② Radial n. in the spiral groove → med. + lat. heads.</p>

## Superficial Muscles of the Front of Forearm

Muscle	Origin	Insertion	Action	N. Supply
① <u>Flexor digitorum superficialis</u>	<ul style="list-style-type: none"> <li>Common flexor origin.</li> <li>Med. border of coronoid process of ulna.</li> <li>Oblique line of front of radius.</li> </ul>	<p>At middle of forearm, the m. divides into 4 tendons. The tendons for the ring and middle fingers are found in <u>superficial</u> plane than those for the little finger and index. The tendons pass deep to the flexor retinaculum → palm → med. 4 fingers. Each tendon, opposite to the proximal phalanx, is pierced by a tendon of flexor digitorum profundus, then it splits into 2 slips which are inserted in the sides of the shaft of the middle phalanx.</p> <p><u>N.B.</u>: - The <u>median n.</u> is adherent to the <u>deep</u> surface of the m.          - The m. occupies a plane midway bet. the deep ms. and the rest of the superficial ms.</p>	<ul style="list-style-type: none"> <li>Flexes the <u>middle and proximal phalanges of the med. 4 fingers.</u></li> <li>Flexes the <u>wrist J.</u></li> <li>Flexes the <u>elbow J.</u></li> </ul>	
② <u>Pronator teres</u>	<ul style="list-style-type: none"> <li><u>Superficial head</u> → from the lower part of the med. supracondylar ridge.</li> <li><u>Deep head</u> → from the med. border of the coronoid process.</li> </ul>	<p>The 2 heads unite → the m. is inserted in the <u>middle of the lat. surface of radius</u> (at the point of maximal convexity to allow maximal pronation).</p> <p><u>N.B.</u>: - The <u>median n.</u> passes bet. the 2 heads.          - The <u>ulnar a.</u> passes deep to both heads. So, the deep head separates the a. from the n.</p>	<ul style="list-style-type: none"> <li>Pronation.</li> <li>Flexion of elbow.</li> </ul>	Median n. by brs. which arise in the cubital fossa.
③ <u>Flexor carpi radialis</u>	Common flexor origin.	The tendon passes under the flexor retinaculum in a <u>special compartment</u> → palm → inserted in the palmar aspect of the base of the 2 <sup>nd</sup> and 3 <sup>rd</sup> metacarpal bones.	<ul style="list-style-type: none"> <li>Flexion of wrist.</li> <li>Abduction of wrist.</li> <li>Flexion of elbow.</li> </ul>	
④ <u>Palmaris longus</u>	Common flexor origin.	The m. has a long slender tendon which passes superficial to the flexor retinaculum → palm → inserted in apex of palmar aponeurosis. This m. may be physiologically <u>absent</u> .	<ul style="list-style-type: none"> <li>Flexion of wrist.</li> <li>Flexion of elbow.</li> <li>Tension of palmar aponeurosis.</li> </ul>	
⑤ <u>Flexor carpi ulnaris</u>	<ul style="list-style-type: none"> <li><u>Humeral head</u>: from the common flexor origin.</li> <li><u>Ulnar head</u>: from the olecranon process and ulnar aponeurosis.</li> </ul>	<p>The tendon is inserted into the pisiform bone. From the pisiform bone, the insertion extends to:</p> <p>a) The hook of hamate by the <u>pisiform-hamate lig.</u>          b) 5<sup>th</sup> metacarpal bone by <u>pisiform-metacarpal lig.</u></p> <p><u>N.B.</u>: - The ulnar n. passes bet. the 2 heads of the m.          - The pisiform may be considered as a sesamoid bone.</p>	<ul style="list-style-type: none"> <li>Flexion of wrist.</li> <li>Adduction of wrist.</li> <li>Flexion of elbow.</li> </ul>	Ulnar n.

**Remember:** All superficial ms. of the front of forearm are supplied by the median n. except the flexor carpi ulnaris (supplied by ulnar n.).

## Deep Muscles of the Front of Forearm

Muscle	Origin	Insertion	Action	N. Supply
① <i>Pronator quadratus</i>	Front of lower $\frac{1}{4}$ of ulna.	Front of lower $\frac{1}{4}$ of radius.	<ul style="list-style-type: none"> <li>Binds radius and ulna.</li> <li>Pronation.</li> </ul>	Ant. interosseous n.
② <i>Flexor pollicis longus</i>	Upper $\frac{2}{3}$ of ant. surface of radius (below the oblique line) and the adjoining part of the interosseous membrane.	The m. is <i>unipennate</i> . Its tendon passes deep to the flexor retinaculum → inserted in the base of the palmar aspect of the distal phalanx of thumb.	<ul style="list-style-type: none"> <li>Flexes all joints of thumb.</li> <li>Help in wrist flexion.</li> </ul>	Ant. interosseous n.
③ <i>Flexor digitorum profundus</i>	<ul style="list-style-type: none"> <li>Upper <math>\frac{3}{4}</math> of ant. and med. surfaces of ulna and the adjoining part of the interosseous membrane.</li> <li>From the ulnar aponeurosis.</li> </ul>	<ul style="list-style-type: none"> <li>The m. divides into 4 tendons which pass deep to the flexor retinaculum → palm → medial 4 fingers.</li> <li>Opposite the proximal phalanges, each tendon passes through the splitted tendon of the flexor digitorum superficialis to reach its insertion in the palmar aspect of the base of the distal phalanx.</li> </ul>	<ul style="list-style-type: none"> <li>Flexion of all joints of the med. 4 fingers.</li> <li>Help in wrist flexion.</li> </ul>	<ul style="list-style-type: none"> <li>The lat. half → by ant. interosseous n.</li> <li>The med. half → by ulnar n.</li> </ul>

**Remember:** All deep ms. of the front of forearm are supplied by the *ant. interosseous n.* (br. from the median n.) except the med. half of the flexor digitorum profundus, which is supplied by the *ulnar n.*



## Superficial Muscles of the Back of Forearm

Muscle	Origin	Insertion	Action	N. Supply
① <i>Anconeus</i>	Back of lat. epicondyle.	<ul style="list-style-type: none"> <li>Lat. side of olecranon process.</li> <li>Upper <math>\frac{1}{4}</math> of post. border of ulna.</li> </ul>	Extension of elbow.	<i>Radial n.</i> (in the spiral groove) by br. which passes through med. head of triceps.
② <i>Brachioradialis</i>	<ul style="list-style-type: none"> <li>Upper <math>\frac{2}{3}</math> of lat. supracondylar ridge.</li> <li>Lat. intermuscular septum.</li> </ul>	Lat. side of base of styloid process of radius. <i>N.B.:</i> - The m. forms the lat. boundary of the cubital fossa. - The m. overlaps the radial n. and vessels in the middle $\frac{1}{3}$ of the forearm.	<ul style="list-style-type: none"> <li>Flexion of elbow.</li> <li>Put the forearm in the midprone position (midway bet. pronation and supination). So, it ends or initiates both pronation and supination.</li> </ul>	<i>Radial n.</i> (in the groove bet. brachialis and brachioradialis).
③ <i>Extensor carpi radialis longus</i>	<ul style="list-style-type: none"> <li>Lower <math>\frac{1}{3}</math> of the lat. supracondylar ridge.</li> <li>Lat. intermuscular septum.</li> </ul>	Back of base of 2 <sup>nd</sup> metacarpal bone (after passing deep to the extensor retinaculum).	<ul style="list-style-type: none"> <li>Extension of wrist J.</li> <li>Abduction of wrist J.</li> </ul>	
④ <i>Extensor carpi radialis brevis</i>	Common extensor origin.	Back of bases of 2 <sup>nd</sup> and 3 <sup>rd</sup> metacarpal bones (after passing deep to the extensor retinaculum).		
⑤ <i>Extensor digitorum</i>	"	The m. divides into 4 tendons which pass deep to the ext. retinaculum → dorsum of hand where they are attached together by intertendinous connections. On the dorsum of the proximal phalanges, each tendon expand forming an <i>ext. expansion</i> . The expansions are triangular with a distal apex and proximal base: <ul style="list-style-type: none"> <li>The base receives the ext. tendons + lumbricals + interossei.</li> <li>The apex divides into 3 slips:               <ul style="list-style-type: none"> <li>Middle slips → attached to base of middle phalanx.</li> <li>2 collateral slips → reunite → attached to base of distal phalanx.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Extension of all joints of the medial 4 fingers.</li> <li>Extension of wrist.</li> <li>Through the ext. expansions and the ms. attached to it, the medial 4 fingers are put in the <i>writing position</i>, i.e., flexion of the metacarpo-phalangeal J. and extension of the interphalangeal J.</li> </ul>	<i>Posterior interosseous n.</i> (br. of radial n.).
⑥ <i>Extensor digiti minimi</i>	"	Extensor expansion of little finger.	<ul style="list-style-type: none"> <li>Extension of all Js. of little finger.</li> <li>Extension of wrist J.</li> </ul>	
⑦ <i>Extensor carpi ulnaris</i>	<ul style="list-style-type: none"> <li>Common ext. origin.</li> <li>Ulnar aponeurosis.</li> </ul>	Back of base of the 5 <sup>th</sup> metacarpal bone.	<ul style="list-style-type: none"> <li>Extension of wrist J.</li> <li>Adduction of wrist J.</li> </ul>	

Remember: ①

② All superficial ms. of back of forearm (7) are supplied by *radial n.* either directly (3) or indirectly (4) through the post. interosseous n.

③ Ms. attached to the *ulnar aponeurosis* (which is attached to the lower  $\frac{3}{4}$  of post. border of ulna):

- Flexor digitorum profundus
- Flexor carpi ulnaris
- Extensor carpi ulnaris

## Deep Muscles of the Back of Forearm

Muscle	Origin	Insertion	Action	N. Supply
① <i>Supinator</i>	<ul style="list-style-type: none"> <li>• Supinator fossa and crest of ulna.</li> <li>• Radial collateral lig.</li> <li>• Annular lig.</li> </ul>	<p>The back, lat. side and front of upper <math>\frac{1}{3}</math> of radius.</p> <p><u>N.B.</u>: The post. interosseous n. penetrates the front of the m. and emerges from its back. The nerve supplies the m. before penetrating it.</p>	<ul style="list-style-type: none"> <li>• Supination.</li> <li>• Binds radius to ulna.</li> </ul>	
② <i>Abductor pollicis longus</i>	<ul style="list-style-type: none"> <li>• Upper <math>\frac{1}{3}</math> of post. surface of ulna</li> <li>• Middle <math>\frac{1}{3}</math> of post. surface of radius.</li> <li>• Back of interosseous membrane.</li> </ul>	Lat. side of base of 1 <sup>st</sup> metacarpal bone.	<ul style="list-style-type: none"> <li>• Abduction of thumb.</li> <li>• Abduction of wrist J.</li> </ul>	<i>Posterior interosseous n.</i> (br. from the radial n.)
③ <i>Extensor pollicis brevis</i>	<ul style="list-style-type: none"> <li>• Lower <math>\frac{1}{3}</math> of post. surface of radius.</li> <li>• Back of interosseous membrane.</li> </ul>	Dorsum of base of proximal phalanx of the thumb.	Extension of the carpometacarpal and metacarpophalangeal joints of thumb.	
④ <i>Extensor pollicis longus</i>	<ul style="list-style-type: none"> <li>• Middle <math>\frac{1}{3}</math> of post. surface of ulna.</li> <li>• Back of interosseous membrane.</li> </ul>	Dorsum of base of distal phalanx of thumb.	Extension of all joints of thumb.	
⑤ <i>Extensor indicis</i>	<ul style="list-style-type: none"> <li>• Lower <math>\frac{1}{3}</math> of post. surface of ulna.</li> <li>• Back of interosseous membrane.</li> </ul>	Extensor expansion of index.	Extension of index.	

Remember:

- ① All deep ms. of back of forearm are supplied by the *post. interosseous n.*
- ② All ms. of back of forearm are supplied by the *radial n.*
- ③ All ms. of back of forearm are supplied by the post. interosseous n. except ms. which are directly supplied by the radial n. :
  - Anconeus.
  - Brachioradialis.
  - Ext. carpi radialis longus.